Workshop Report

Participatory Evaluation of Earthquake Risk and Resilience in Lalitpur Sub-Metropolitan City

25-26 March 2014, Lalitpur Sub-Metropolitan City Assembly Hall, Pulchok

ORGANIZED BY LALITPUR SUB METROPOLITAN CITY IN PARTNERSHIP WITH

GLOBAL EARTHQUAKE MODEL (GEM),
SOUTH ASIA INSTITUTE (SAI), HEIDELBERG UNIVERSITY,
CENTER FOR DISASTER MANAGEMENT AND RISK REDUCTION TECHNOLOGY (CEDIM),
NATIONAL SOCIETY FOR EARTHQUAKE TECHNOLOGY - NEPAL (NSET) AND
USAID

PURPOSE OF THE REPORT

This report summarizes the results from the Workshop on "Participatory Evaluation of Earthquake Risk and Resilience in Lalitpur Sub Metropolitan City" held from 25th- 26th March 2014, at Lalitpur Sub Metropolitan City Assembly Hall, Pulchok.

The aim of this report is to foster further communication and exchange on earthquake resilience between the different administrative levels from the Lalitpur Sub-Metropolitan City (LSMC), the Lalitpur Wards and relevant local stakeholders including the National Society for Earthquake Technology Nepal (NSET) based on the Resilience Scorecard results

INTRODUCTION AND CONTEXT FOR SCORECARD DEVELOPMENT IN KATHMANDU

There has been a long-term engagement between academics, practitioners, and policy communities in reducing the potential for property damage, human suffering, and the loss of lives from an earthquake in the Kathmandu Valley. While losses are the outcome most commonly associated with an earthquake event, it is increasingly becoming clear that some communities will have differing capacities to prepare for an event, will react differently during an event's aftermath, will adjust to the circumstances of an earthquake in a different manner, and will recover from damages disproportionately if they occur. Great emphasis is being placed on fostering disaster resilient communities as a result since communities that can increase their resilience are in a better position to withstand adversity and to recover more quickly when earthquakes occur.

This report defines resilience as "the ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions" (UNISDR 2009). How communities will be affected following an earthquake may be conceptualized in terms of their resilience, and numerous perspectives have been developed to advance the underpinnings of the concept. In general, resilient communities are those that take deliberate action to reduce hazard risks, prepare for, and accelerate recovery in the face of hazards and disasters.

There are a number of characteristics of what makes up a resilient community. These include, but are not limited to: 1) the prevalence of institutions and leaders that provide enabling conditions through community involvement and governance; 2) the engagement in diverse livelihoods; 3) the management of environmental services; 4) the utilization of effective land use and structural design controls that complement environmental, economic, and community goals; 5) having community members that are aware of hazards and risk information; 6) having the capability of receiving notifications and alerts and warning at-risk populations; 7) having mechanisms established to address emergency needs at the community level; and 8) having plans in place prior to a hazard event that accelerate disaster recovery, engage communities in the recovery process, and minimize negative environmental, social, and economic impacts. Additional examples of disaster resilient communities are those that employ mitigation and planning programs aimed at hazard avoidance. Governments are coming to realize that planning can be a powerful tool for building disaster resilient

communities and great potential exists for disaster loss and other impact reduction.

CONTEXT FOR SCORECARD DEVELOPMENT IN KATHMANDU

An essential step for developing plans to enhance the resilience of communities is the ability to objectively measure resilience. Measurement is vital not only to evaluate and benchmark the baseline conditions of what makes communities resilient, but also to help communities to understand the factors that lead to adverse impacts and the diminished capacity to respond to an event. Just as successful companies have identified areas of opportunity for betterment and benchmarked their performance against industry peers, governments are finding it useful to compare the performance of communities in terms of their resilience. The latter is partially to attract public interest in disaster loss reduction, to set priorities, to measure progress, and to aid in decision-making processes. Composite indicators (often referred to as indices) are often employed as useful tools to accomplish this objective because they convey information that may be utilized as performance measures. Generally speaking, an indicator is a quantitative or qualitative measure derived from observed facts that simplify and communicate the reality of a complex situation. A composite indicator is the mathematical combination of individual indicators that represent different dimensions of a concept that cannot be fully captured by any individual indicator alone.

Although indicators are increasingly recognized as useful tools for policy-making and public communication because they convey information that may be utilized as performance measures, they are subject to a number of criticisms that are highly applicable to measuring resilience in socially, culturally, and politically complex places such as the Kathmandu Valley. Indicators, for instance, may send misleading messages if they are poorly constructed or misinterpreted. In addition, indicators may invite overly simplistic conclusions regarding areas of opportunity to enhance the resilience of communities. Indicators may also lead to inappropriate conclusions if dimensions of resilience that are difficult to measure are ignored. Such dimensions include the amount of social networking within and between communities, cultural attributes, and decision-making.

To capture local processes for decision-making and the production of relevant indicators and targets for producing actionable information different types of indicators that are representative of the local knowledge, conditions, and context are needed. These types of indicators cannot be computed from publically available databases (such as those from national censuses) and require the design of targeted surveys with a specific audience in mind. It is within this context that we have developed an alternate „Scorecard approach" based on a participatory assessment process.

The purpose in the development of the Scorecard approach is to build a tool that can capture the key functional and organizational areas for urban resilience with local government officials as the targeted decision-making body. The implementation of the Scorecard in Lalitpur – as implementation of the approach anywhere – required engagement into a preparatory process where the local context was captured into the design of the indicators (questions) and targets (answer schemes) of the Scorecard. It was anticipated that a Scorecard approach would provide a "broad brush" assessment to enable local policy makers and communities to establish priorities for more in-depth analysis, to allocate funds, and to develop emergency and disaster management programs more effectively. The use of the scorecard helped to identify the degree to which communities are able to

build their resilience because they are able to identify gaps and opportunities for resilience enhancement. The latter allowed communities to: 1) foresee and/or acknowledge threats and risks; 2) work with emergency services and other agencies on earthquake risk reduction; 3) have a sense-of-community and social capital; and 4) take collective responsibility to reduce the reduce the impacts of disruptive events and disasters.

DESCRIPTION OF SCORECARD OBJECTIVES AND APPROACH

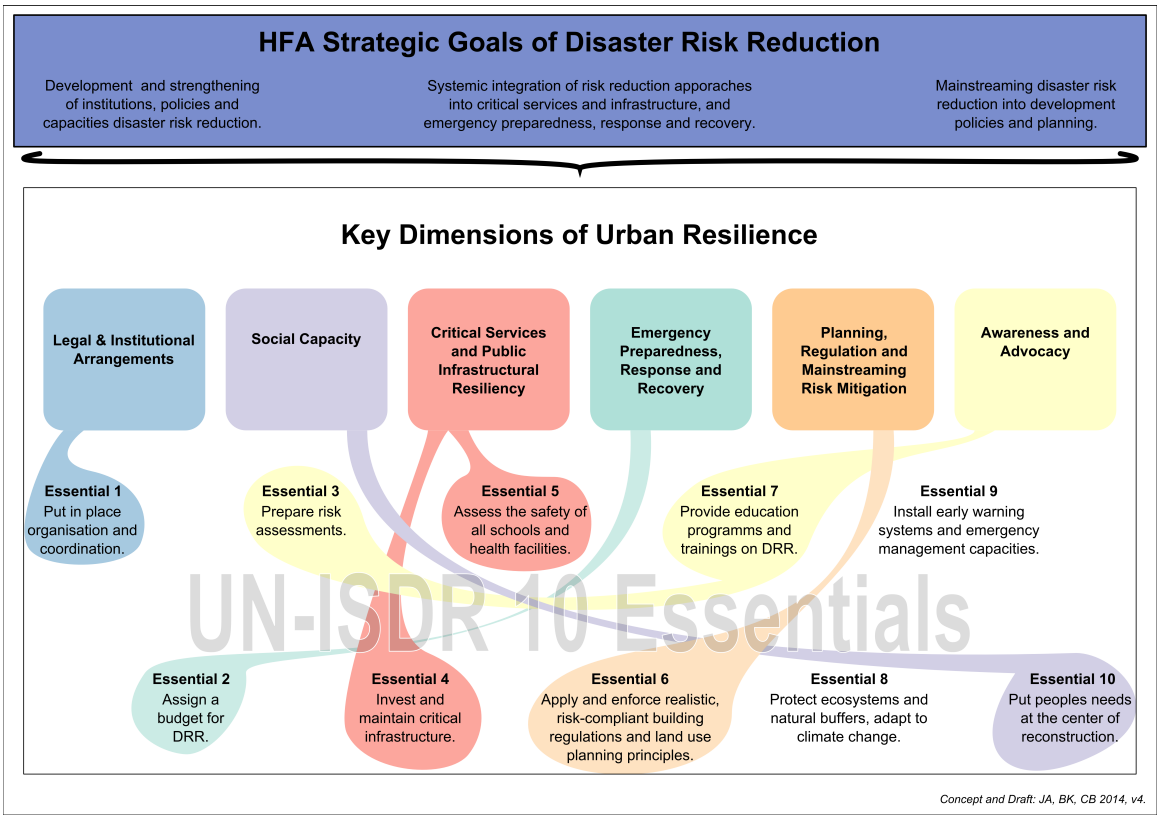
Resilience has been given various definitions depending on the context to which it is applied and the diciplinary background of those interested in the topic. The concept of resilience can be applied to each of the different sub-systems or sectors within a city which may be exposed to external shocks and stresses. The resilience of cities is not confined to infrastructure systems alone, but encompasses also social entities: the city dwellers, decision makers, political groups. While the term 'resilience' was described in the section above as the ability of systems or communities exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions, it is necessary to break down and practically apply this definition to the different sectors in a city in order to measure cities resilience to crisis and disasters.

The concept of resilience has found its way into disaster risk management. It is mentioned in the Hyogo Framework for Action (HFA), which establishes for itself a goal of "building resilience in nations and communities", and more recently in the United Nations campaign for urban disaster reduction, which has been undertaken under the banner "Making Cities Resilient". The United Nations International Strategy for Disaster Reduction (UN-ISDR) defines resilience as: "Capacity of an individual, community, organization, city and nation to respond, cope and recover from disaster". Further, the UN-ISDR has defined the so-called 10 Essentials, representing a set of indicators in the form of a checklist by which resiliency can be measured[1].

Together with local stakeholders and experts on disaster risk reduction, a Multi-level City Resilience Scorecard (MCRS) has been developed to address resiliency of key dimensions within a City government's functional and operational activities. The following six dimensions where mainstreaming of risk reduction into planning and decision making processes take place at the local level have been identified (See Figure):

1. Legal and institutional arrangements
2. Social capacity
3. Critical services and public infrastructure resiliency
4. Emergency preparedness, response and recovery
5. Planning, regulation and mainstreaming risk mitigation
6. Awareness and Advocacy

[1]UN-ISDR Ten-point checklist for local governments - Ten essentials for making cities resilient, http://www.unisdr.org/english/campaigns/campaign2010-2011/documents/230_tenpointchecklist.pdf



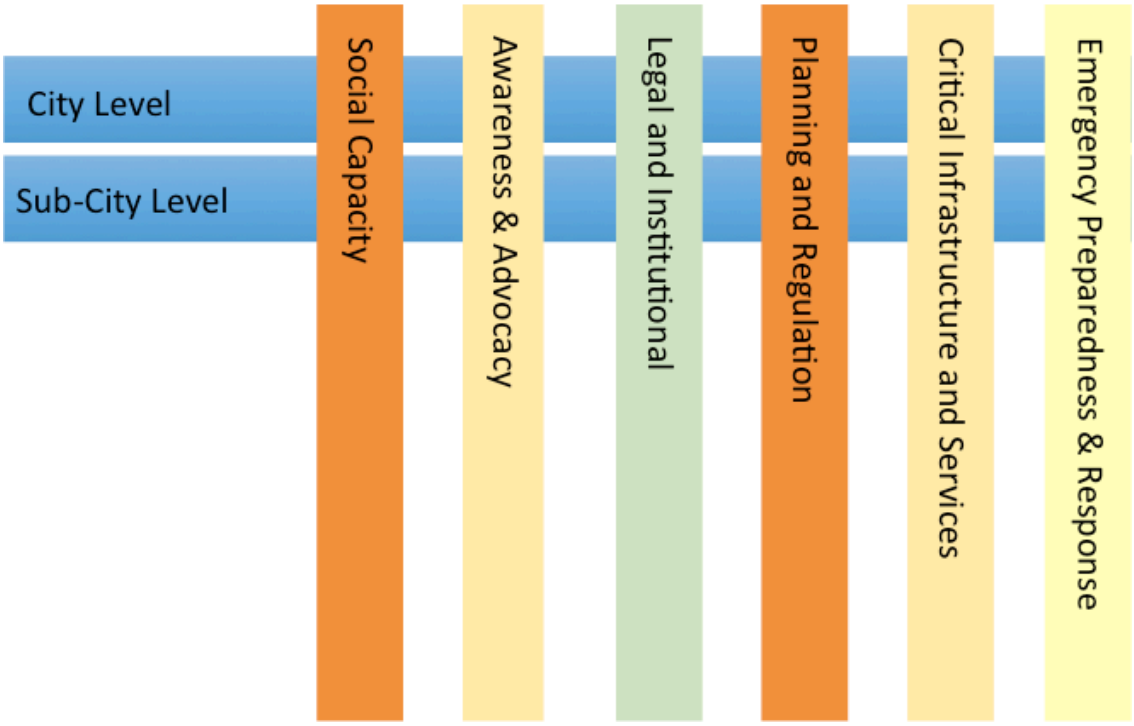
These six key areas of the Scorecard are closely aligned with the six elements of the HFA[2,3]. They also are connected tightly with the 10 Essentials. The rationale for selecting these six dimensions can be traced in the Figure above by following the information from top to bottom of the chart. The main aim of the Scorecard is to track progress on the **mainstreaming** of risk reduction approaches in the city's organizational, functional, operational and development systems and processes. The urban resilience goal is further divided into three **strategic goals** shown in the chart. Each of the strategic goals corresponds to one or more **key dimensions** analysed in the Scorecard where these goals are to be implemented. Several questions that were developed for the Scorecard corresponding to each of the six key areas of urban resilience are shown. Finally, it is shown how the key dimensions are connected to one or more of the 10 Essentials.

The Scorecard was developed to address key issues of urban resilience at multiple-levels of geography. While the key dimensions of the Scorecard are consistent across different scales, the indicators (questions) and targets (answer schemes) along each of the themes within the six dimensions were adjusted to represent the appropriate scale. For example, at enforcement and implementation of building codes is a function at the Municipal and not the sub-municipal (i.e. Ward) level. To ensure relevancy to the local context, targets (answer scheme) and indicators (scorecard questions) for measuring urban resilience in Lalitpur for each of the six key areas are based on in-depth interviews with various stakeholders such as academia, urban planners and urban planning associations, community development associations, city and local officials, national and international NGOs and relief and response organizations.

[2] Hyogo Framework for Action 2005-2015: Building the resilience of nations and communities to disasters, United Nations Strategy for Disaster Reduction, http://www.unisdr.org/hfa

[3] Putting Words into Action (2007), United Nations Strategy for Disaster Reduction, Geneva

In this way, the aim was to collaboratively develop and implement an initial Scorecard which can guide the Lalitpur Sub-Metropolitan Municipality and other stakeholders in understanding potential gaps in resilience, in which measures can be put into place to fill those gaps, and critical areas where further analysis is needed.



Workshop Setting and Participants

The workshop was held with two different groups of participants, first Ward representatives from Lalitpur and second Municipal representatives from different departments concerned with Disaster Risk Reduction and Management. Each group conducted the survey with the help of a local facilitator. The facilitator ensured that all questions were adequately understood, misinterpretation was minimized and discussions were steered and targeted. All questions were translated and if necessary explained using examples from Lalitpur. After this, the answers were transferred from each individual participant using remote controllers to a base station. Thus all participants transmitted their answers in time and completeness could be ensured.

On the first day, 20 out of 22 Wards within Lalitpur Sub-Metropolitan City (LSMC) were involved and had designated representatives for the workshop. Ward No. 6 and No. 21 were not present.

On the second day all relevant departments from the Municipality were invited to join the workshop. Here, 20 representatives from nine different departments took part. Table 1 gives you an overview which Wards and departments were actually present. On the second day, all participants came together again for the concluding remarks and the group discussion.

Table 1: Number of participants per Ward and Department.

WARD NO. / MUNICIPAL DEPARTMENT	REPRESENTED BY
1, 2, 3, 4, 7, 8, 12, 13, 14, 15, 16, 18, 19, 20, 22	1 participant
5, 9, 10, 11, 17	2 participants
Administration, Community Development, Conservation	1 participant
Accounting, Law, Public Works, Revenue	2 participant
City Police	3 participant
Urban Development	4 participant

RESULTS

STAKEHOLDER INTERACTION PROCESS

As previously mentioned, the scorecard approach starts with the outlining and defining of key questions along the six thematic areas. This was done in a very productive way between experts from NSET, GEM, SAI and CEDIM. This iterative process of contextualization of the questionnaire, serves multiple purposes: first to identify the current level of understanding of resilience, second getting to know existing challenges in the politicized environment of local governments, third to familiarize potential facilitators with the background understanding and concept to ensure proper translation

and management of group processes. The final result of this was a customized questionnaire with a concise set of questions along the six themes. The themes were covered by precise questions with adequate answers having a defined logic order. Additionally the facilitators provided examples and explanations where necessary.

During the workshop the session setup facilitated the display of results after the participants casted their votes. Engaging with the participants in such a way, helps to reduce initial apprehension by minimizing the fear of data manipulation as well as sending positive signals to take the participants expertise for granted. Hence it was possible to discuss relevant matters at the spot, while not imposing pre-existing ideas and concepts.

Therefore, key results consist of but are not limited to the analytic results. The interaction with local stakeholders revealed much more qualitative insights to urban resilience, and there is substantially more to be learned from this kind of multi-level engagement as usually can or is done with sole indicator-based methods.

WARD WISE ANSWERS

The distribution of scores for all Wards is depicted in Figure 1. While 42% of the answers are on a Low Score (2), at least 7% of the respondents claim the Highest Score (4) for some of the questions.

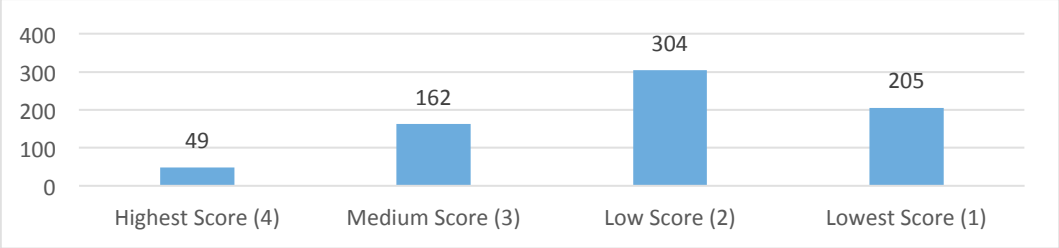


Figure 1: Distribution of answers for all Wards.

If we compare the skewness[4] of the score distribution of individual Wards, most of them have similar positive skew (right-skewed) around 0.41. Single Wards have very high right-skewed values of 1.21 and 1.02 (Ward 10 and Ward 11 respectively). This is related to the participants' perception to perform towards the lower scores of the range given by the answers. This tendency is well known in most social science questionnaire based assessments. The only outlier with a negative skew (left-skewed) is Ward 7 (-0.43)[5].

Individually the Wards show distinct trends for all the questions. A complete set of the results per Ward is given in the Appendix.

The range of all answers around the average value on a thematic basis is given in Figure 2. *Planning and Regulation* has the smallest range among the themes, while *Emergency Response* and *Critical*

[4] In statistics, skewness is a measure of the asymmetry of the probability distribution of a real-valued random variable about its mean. For unimodal distributions, the value can be interpreted as a measure of tendency towards a specific value.

[5] Another distinct characteristics of Ward No. 7 is the exceptional fast response rate: All questions were answered in less than half the time other participants needed.

Services has the largest range and therefore the lowest consensus among the participants. The highest average score occurs in the *Awareness & Advocacy* theme (2.54). *Emergency Response* has the lowest average score (2.03) with the widest range (2.18).

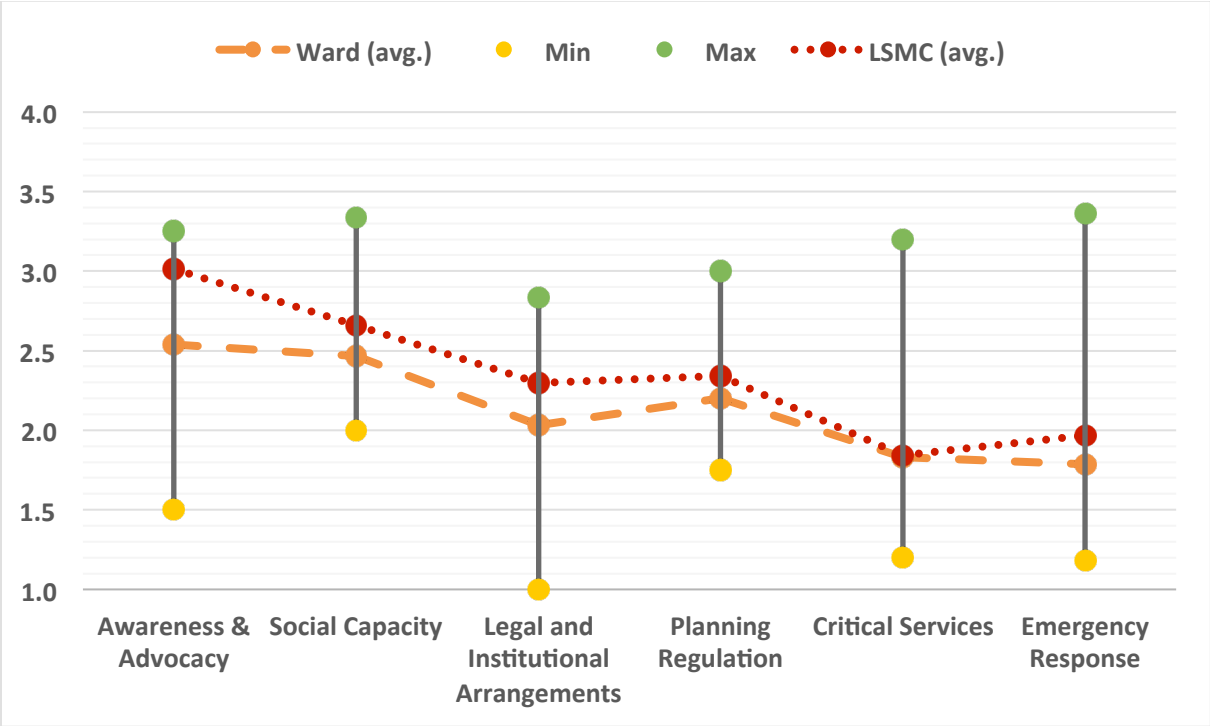


Figure 2: Min, Max, and Mean scores of the Wards per theme and the average LSMC score.

MUNICIPALITY WISE ANSWERS

The distribution of answers from the Municipality is depicted in Figure 3. While 37% of the answers are on a low score (2), at least 5% of the respondents claim the highest score (4) for some of the questions.

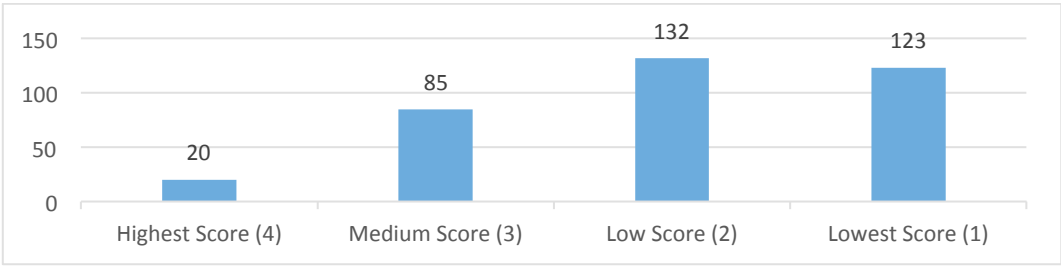


Figure 3: Distribution of answers for the Municipality.

Individually the different departments show distinct trends for all the questions. A complete set of the results per department is given in the Annex.

In comparison with the Wards, the Municipality has a much higher range of given answers for all themes. Corresponding to less consensus among the participants. *Social Capacity*, *Planning Regulation* and *Emergency Response* even reach across the full range. Nevertheless, having 19 respondents at least the mean results are quite robust.

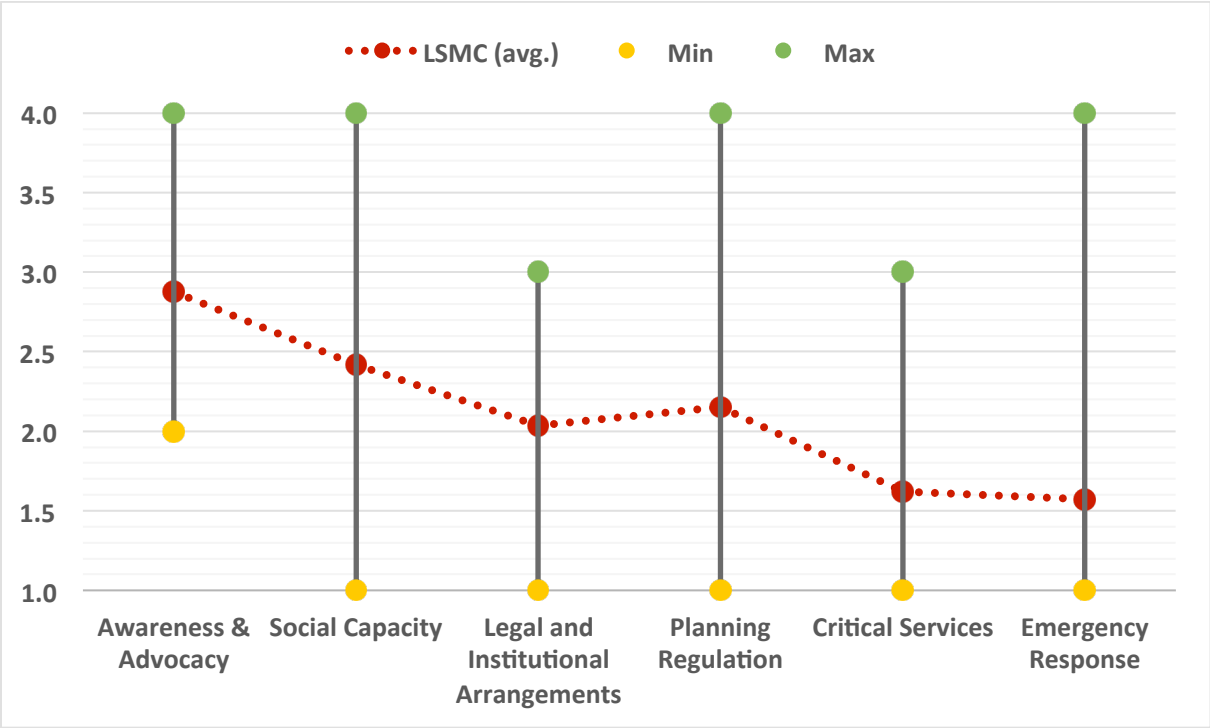


Figure 4: Min, Max, and Mean score of the Municipality per theme.

THEME WISE ANSWERS

The average answers of all the wards and the municipal departments along the six themes are shown in the Figure 5 (combined per theme also in the Appendix). In general both groups do have high conformity in their perception along all the themes. The LSMC departments rate themselves slightly better, especially in terms of *Awareness & Advocacy*. The level of resilience of *Critical Services and Infrastructure* is perceived lowest, while some of the questions from *Emergency Response* are also within this lower score group. Especially the questions regarding the existence of post-earthquake response plans (7 to 11) within this theme fall under this lower group.

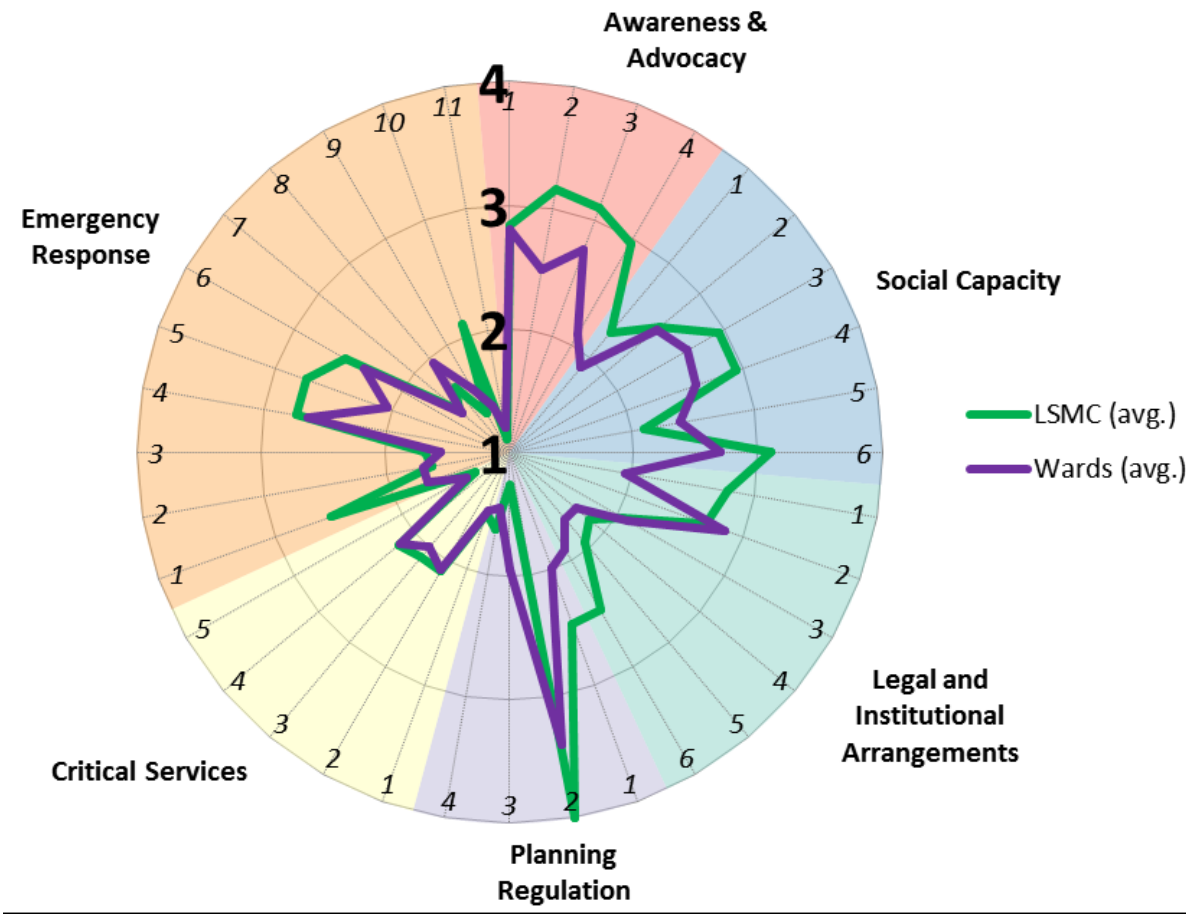


Figure 5: Answers of Municipal Departments and Wards.

The first theme *Awareness & Advocacy* has the highest scores for both Ward representatives and Municipal delegates (2.54 and 3.01 respectively). More than 50% of all participants think that **many** people within Lalitpur do worry about a destructive earthquake happening that will impact their life and property, additionally 13% think **almost all** do worry (question 1) (see appendix). There is a strong correlation for this set of questions with the existence of awareness raising programs and local groups engaged in dissemination campaigns. It can be assumed, that the participants perception of a relative high awareness of the general public is based on this observation and therefore has some validity. Despite the efforts to provide professional training for structural mitigation or emergency management by a variety of NGOs, 20% of the Wards are not aware of such capacity building programs.

On the other hand, if we look at *Social Capacity* issues, the picture becomes a bit more complex: the overall judgment of the participants shows a relative low score, with integration of minorities and participation in formal and informal institutions being better off than the quality of social assistance programs. Question five instead highlights an important issue, as representatives from the Municipality do rank the effectiveness of public engagement in decision making processes lower than the Ward representatives.

In the *Legal and Institutional Arrangements* theme, concerns about inter- and intra-institutional coordination and cooperation become visible. The three questions (3 to 5) targeting this field are rated the lowest by the Wards and the Municipality with an average below 2 (between 20% and 30% vote "*No coordination or cooperation*"). On the positive side, they know about the existence of

regulations for disaster risk reduction. Nevertheless, besides claiming weak implementation of such ordinances, there is a great variation in being confident that governmental and non-governmental institutions act jointly to prepare for, respond to and recover from a devastating earthquake (question 6).

The most interesting results are within the *Planning Regulation* theme. All Municipal representatives and 95% of the Ward representatives think, that earthquake resistant building construction codes are enforced for most cases. Obviously this is not the case and either a conceptual misunderstanding or false knowledge biased this question. Earthquake resistant building codes are only enforced for a few public buildings in Lalitpur. Even if code compliance with the existing Nepalese Building Code is a mandatory step in every building permit process, implementation and enforcement is not monitored. Only by reason a building is "new" and in many cases built with reinforced concrete framing, it does not mean it is earthquake resistant[6].

The questions concerning *Critical Infrastructure* are among the lowest scores from the complete survey. 70% of the participants think that only in a few exceptional health or educational facilities non-structural improvements to reduce seismic risk have been incorporated. Almost two-thirds (60%) of the Ward officials affirm that the Ward offices do not have a business continuity plan which could adhere public services during emergencies. The same applies to the last question, regarding repair and replacement plans for critical lifelines. This is mainly because such activities are not considered to fall within the responsibility of the Ward or Municipality.

If we look at the level of effectiveness and competences of disaster management in terms of mechanisms for *Preparedness, Response and Recovery*, only two Wards claim to have communicated to **almost all** emergency responders a designated meeting place for coordinating emergency response activities (question 2). The Municipality participants are more pessimistic in a manner in which almost half of them think that responders do **not know** about such a place at all, while 53% think **few responders** know about it. Except for fire suppression, the Municipality believes to a high degree no contingency plans exist for post-earthquake search and rescue, mas care shelter, debris removal and reconstruction, health and sanitation services (question 7-11). The Wards are also very doubtful in this regard, but put Search and Rescue Services as the exception, where plans exist but implementation is lacking. This shows the different levels of responsibilities, while Wards are in charge of smaller search and rescue units, fire suppression is under the Municipality.

RANKING RESULTS

There are great variations among the different Wards accounting for their different environmental- and socio-economic configuration. The relative ranking of the Wards in thematic areas reveals strengths and weaknesses of particular Wards. The following table shows the upper and lower 10% of the ranked Wards in thematic areas (Table 2). Figure 6 shows the ranking result for the overall score across all themes.

All the ranking results for individual themes are depicted in the Appendix.

[6] NSET should take this as a serious feedback from local stakeholders. After 21 years working in Nepal and Lalitpur, the level of knowledge for this extremely important point is alarming.

Table 2: Thematic ranking results.

THEME	UPPER 10% WARDS	LOWER 10% WARDS
AWARENESS & ADVOCACY	7, 16, 15	10, 1, 3, 11
SOCIAL CAPACITY	20, 18, 17, 16, 15, 14, 10	1, 4
LEGAL AND INSTITUTIONAL ARRANGEMENTS	22, 7, 4	1, 9
PLANNING & REGULATION	15, 7, 2	9, 10, 14, 17
CRITICAL SERVICES	22, 7	13, 1, 11, 17, 18
EMERGENCY RESPONSE	7, 4	1, 9

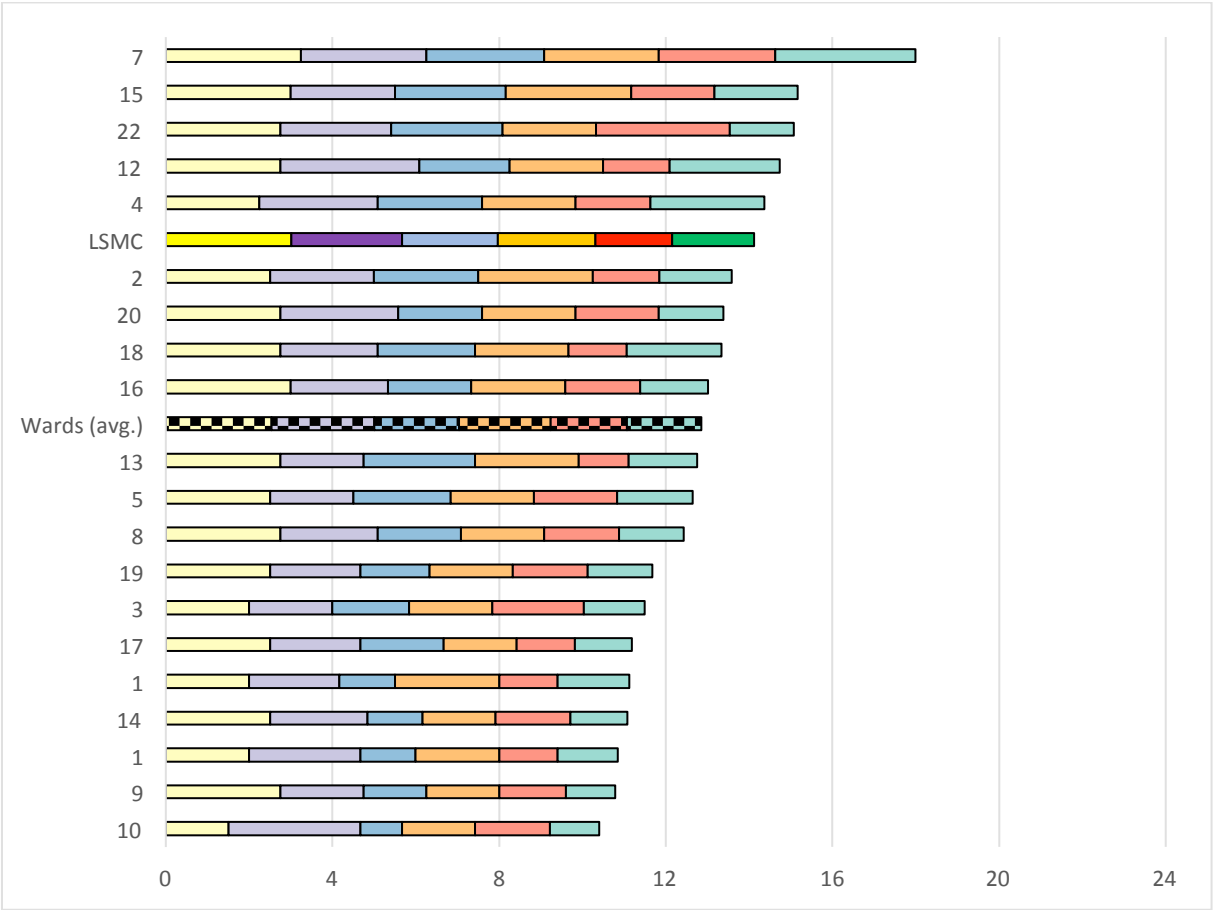


Figure 6: Overall score ranking.

INTERPRETATION AND FINDINGS

- Awareness of and knowledge about *Private Retrofitting and Structural Resilience* (T4_Q3) differ greatly between the participants despite long-term engagement of local stakeholders like NSET.
  - Retrofitting itself is a new concept as compared to the new construction incorporating earthquake resistant element in buildings. Retrofitting has been carried out mostly in public schools (Gov Owned) with the engagement of local stakeholders like NSET and in some public institutions, but very rare in private infrastructures. Hence people who rated high must have considered school retrofitting and marked accordingly.
- Lack of understanding/knowledge about Construction Code Enforcement and Private Retrofitting in the *Planning and Regulation* theme (T4_Q2, T4_Q3).
  - LSMC is the first Municipality to enforce the National Building Code (NBC). So it is quite natural for Municipal officials to score high as they have been implementing it over the years. They have been quite effective as compared to other municipalities. It is important to note that NBC focuses more on new construction. Hence enforcement will obviously be low in the area which has been already built particularly the city core.
- Agreement was highest among the participants in the *Planning and Regulation* theme.
  - Planning and Regulation got the highest score because the evaluators were involved in the planing process within the municipalities. This is because of the limited number of people outside the municipality could participate in the workshop the maximum number of participants came from within the municipality office.

INTERPRETATION AND FINDINGS OF DISCUSSIONS

Despite of series of interactions on the scorecard with NSET and other stakeholders to make it simple to understand and to minimize misinterpretation, explanation of each question during the workshop using local examples was important to ensure that all participants understood the questions properly as the participants were of diverse backgrounds, educational levels, etc.

Pre-testing of the questionnaire to familiarize participants with the device as well as the system with a simple question related to daily life was a good way to start the survey

Social vulnerability is well covered; however economic vulnerability has not explicitly come out though mainstreaming is stated.

No of participants is crucial, so need to have adequate representative sample. Just one participant from one ward may lead different result as seen in some wards of LSMC

LESSONS LEARNED, FOLLOW-UP AND FUTURE DIRECTION

After having conducted this first implementation round of the scorecard, we encourage the participants to take this methodology and the findings up to further expand their endeavors making their city more resilient. Several issues need to be addressed by the local and municipal government to further

- Assist the Municipal Disaster Management Committee to conduct consecutive assessment on identified key infrastructures
- Establish assessment plan for tracking resilience progress
- Establish monitoring protocol for NSET activities and projects
- Scoping workshop for resilience target setting
- Defining resilience assessment standards for different infrastructure services
- Agree on a common vision of urban resilience, engaging the civil society, community stakeholders, law enforcement groups and local authorities

The methodology has been successfully deployed and tested, its efficacy proven: The following are the main findings:

- The methodology is a powerful tool to assess gaps in community resilience in an urban setting, which has not been actively considered so far in planning and implementation of disaster risk management actions in Nepal.
- The result is instant, effective for self-realization and motivating to take actions in the area where the city is lacking
- The methodology makes the process participatory and functions as a tool for self-realization and motivation allowing stakeholders to take actions in the area where participation in resilience enhancement is lacking. Since the results are instant, everybody is totally engaged in the process. Unlike other tools in which "experts" deliver and all others are made to "listen, understand, and do", people asked, made decisions, and participated with full understanding of what was going on. The participants were never "scared" with the scientific expressions, and exercised ownership of the entire process.
- The process is simple for the participant and interesting with the use of new technology, they do not have to write, it is like playing a game or using TV remote, so even an illiterate can participate. Thus a very high level of scientific process was brought from "Pavia and Karlsruhe to the community level" of Lalitpur with the participants fully involved in the research process.
- Implementing the tool at the individual level and at the municipal level made it useful to understand and capture the perspectives and perception at the municipal authority level and also at the grass roots level.

THEME: AWARENESS AND ADVOCACY

WHAT IS THE LEVEL OF AWARENESS AND KNOWLEDGE OF EARTHQUAKE DISASTER RISK?

Question	❶	❷	❸	❹
How many people in your Ward are concerned about a destructive earthquake happening that will impact their life and property?	Almost all	Many	A few	None
What mechanisms exist for people to inform themselves about disaster safety, preparedness and risk reduction (Brochures, Flyers, and Public Notice Boards)?	Are available and highly visible at different locations in your Ward	Are available and somewhat visible in some locations in your Ward	Are available upon request only	Are not available
Do public outreach activities exist for the general public to inform themselves about disaster safety, preparedness and risk reduction (e.g earthquake safety drills and demonstrations, or meetings in neighborhoods on family emergency planning)?	Often and regularly held with widespread participation	Sometimes held with some participation	Rarely held with limited participation	Never held
To what extent have trainings and capacity building programs for professionals been put in place to develop expertise for structural mitigation or emergency management?	Many different types of programs that are effectively implemented and regularly reviewed	Some programs, implemented periodically	Limited programs offered sporadically	No programs

APPENDIX: Questionnaire (nepali / english version)

THEME: SOCIAL CAPACITY

WHAT ARE THE CAPACITIES OF THE POPULATION TO EFFICIENTLY PREPARE, RESPOND AND RECOVER FROM A DAMAGING EARTHQUAKE?

Question	❶	❷	❸	❹
Are healthcare and social assistance programs available for vulnerable groups (e.g. free clinics)?	Many programs with excellent service	Few programs with good service	Limited programs with poor service	No programs
What degree of ties and connections exist between people in your Ward?	Most people know each other well and many have strong ties	Most people know each other well and a few have strong ties	Some people know each other but few have strong ties	Most people do not know each other at all
What is the level of social integration of minorities and differing castes within the Ward?	High	Moderate	Low	Almost none
What is the level of participation within formal and informal institutions?	Widespread	Some	Few	Almost none
To what extent are residents in your Ward effectively engaged and heard in decisions made by authorities?	Just about always	Most of the time	Some of the time	Never
Are special programs in place to protect historic buildings and cultural heritage?	Programs are in place to protect both private and public historic buildings and cultural heritage	Programs are in place to protect only public historic buildings and cultural	Only on an individual bases historic buildings and cultural heritage are	No preservation programs exist

		heritage	preserved	

THEME: LEGAL AND INSTITUTIONAL ARRANGEMENTS

HOW EFFECTIVE ARE MECHANISMS TO ADVOCATE EARTHQUAKE RISK REDUCTION IN YOUR WARD?

Question	❶	❷	❸	❹
Have regulations and ordinances for earthquake safety and risk reduction been effective for your Ward?	Most regulations have been fully implemented	Some regulations have been implemented	Regulations exist but they have not been implemented	Regulations do not exist
Are there personnel with clear roles and responsibilities for Disaster Risk Reduction (DRR) in your Ward?	There are designated and trained persons whose main function is DRR	There are designated and trained persons, but their main function is not DRR	There are persons without training or expertise and their main function is not DRR	There are no persons with such functions
To what extent are there well-defined mechanisms of coordination and cooperation for disaster preparedness, safety and risk reduction between your … Ward and neighboring Wards?	Very strong coordination and excellent cooperation	Somewhat strong coordination and cooperation	Limited coordination and weak cooperation	No coordination or cooperation
… Ward and the Municipality?	Very strong coordination and excellent	Somewhat strong coordination	Limited coordination and weak	No coordination or cooperation

	cooperation	and cooperation	cooperation	
… Ward and Private Enterprises through Cooperate Social Responsibility (including NGOs)?	Very strong coordination and excellent cooperation	Somewhat strong coordination and cooperation	Limited coordination and weak cooperation	No coordination or cooperation
How much confidence do you have in governmental and non-governmental institutions acting jointly to prepare for, respond and recover from a devastating earthquake?	Widespread confidence	Some confidence	Limited confidence	Very little confidence

THEME: PLANNING, REGULATION, AND MAINSTREAMING RISK MITIGATION

WHAT IS THE PERCEIVED LEVEL OF COMMITMENT AND MAINSTREAMING OF DISASTER RISK REDUCTION THROUGH REGULATORY PLANNING TOOLS?

Question	❶	❷	❸	❹
To your knowledge are earthquake safety and risk reduction development guidelines recognized and enforced in your Ward?	In most cases	In some cases	Recognized but not enforced	Are not present
To your	Enforced for some	Enforced for a few	Not enforced	Codes

knowledge are earthquake resistant building construction codes enforced in your Ward?	cases	cases		do not exist
To what extent is the reinforcement and retrofitting of private infrastructure carried out (e.g. residences and private businesses)?	Carried out for most private infrastructure	Carried out for some private infrastructure	Carried out for limited private infrastructure	Rarely carried out
Is earthquake insurance available and utilized by residents and businesses?	Extensive availability exists/utilized for most residences and businesses	Some availability exists/some utilization for residences and businesses	Limited availability exists	No insurance is available or utilized

THEME: EMERGENCY PREPAREDNESS, RESPONSE, AND RECOVERY

WHAT IS THE LEVEL OF EFFECTIVENESS AND COMPETENCY OF DISASTER MANAGEMENT INCLUDING MECHANISMS FOR RESPONSE AND RECOVERY?

Question	❶	❷	❸	❹
To your knowledge, do people in your Ward store food, water and fuel that will be available for more than one week following an earthquake?	Most	Some	Few	**Almost None**

APPENDIX: Questionnaire (nepali / english version)

Do you have a local center for implementing and coordinating emergency response and management?	Available and fully operational	Available but partially operational	Available but not operational	**Not available**
Are there standard operational procedures (SOP) that include communication plans for coordinating emergency rescue and response activities of relevant units in your Ward (e.g. Emergency Command System)?	Well defined procedures, and fully functional for all relevant units	Basic procedures, with limited functionality for all relevant units	Limited procedures for some units	**No operational procedures**
Are funds available for emergency preparedness, response and recovery operations?	Funds are directly available and can be used at the ward's discretion	Funds are available but with legal restrictions and special requirements	Funds are planned for but are not available	**Funds are not available**
Are human resources that are coordinated and trained available for emergency preparedness, response and recovery operations (including volunteers and/or community organizations)?	Many human resources available	Some human resources available	Limited human resources available	**Insufficient human available**
Is equipment readily available that can be used for prompt and effective emergency rescue, response, and cleanup operations?	Many equipment types exist that are readily available	Some equipment types exist that are readily available	Some equipment types exist but they are not readily available	**No equipment exists that is readily available**

Theme: Emergency Preparedness, Response, and Recovery (cont.)

Question	❶	❷	❸	❹
Is there a response plan for post-earthquake emergency operations available for … health and sanitation services?	Plan exists, implemented, and regularly updated	Plan exists and implemented	Plan exists but not implemented	**No plan exists**
… search and rescue services?	Plan exists, implemented, and regularly updated	Plan exists and implemented	Plan exists but not implemented	**No plan exists**
… mass care services including shelter and food provision?	Plan exists, implemented, and regularly updated	Plan exists and implemented	Plan exists but not implemented	**No plan exists**
… fire suppression services?	Plan exists, implemented, and regularly updated	Plan exists and implemented	Plan exists but not implemented	**No plan exists**
… debris removal and reconstruction services?	Plan exists, implemented, and regularly updated	Plan exists and implemented	Plan exists but not implemented	**No plan exists**

Theme: Critical Services and Public Infrastructure Resilience

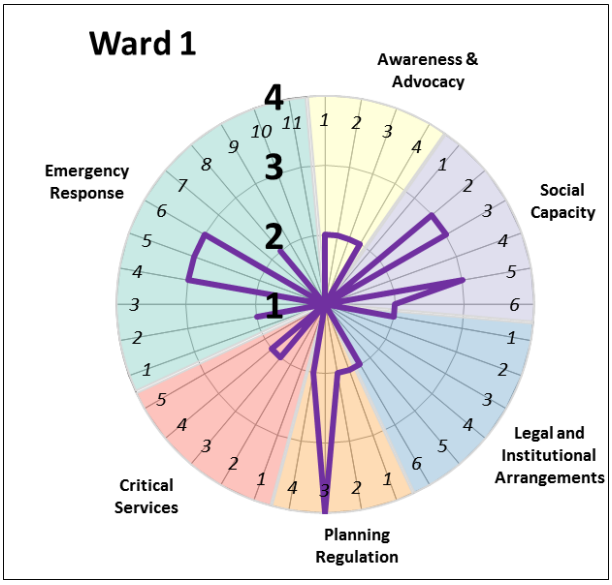
WHAT IS THE LEVEL OF RESILIENCE OF CRITICAL SERVICES TO DISASTERS?

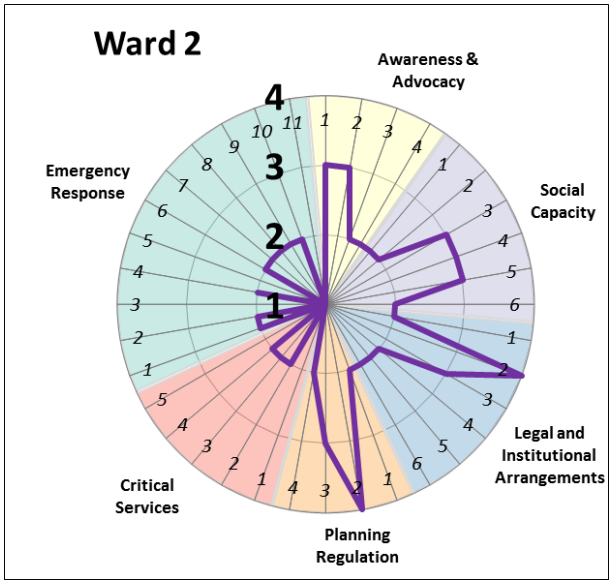
Question	❶	❷	❸	❹
To what extent is the reinforcement and retrofitting of	Carried out for most critical public	Carried out for some critical public	Carried out for few critical public	Not carried out

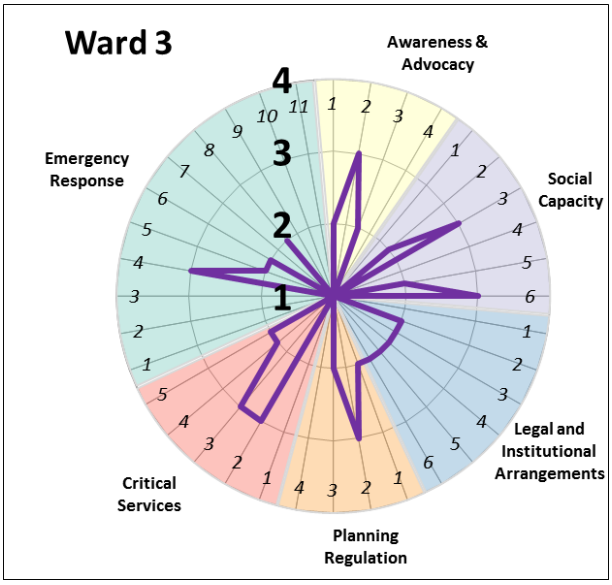
public critical infrastructure such as schools and hospitals carried out?	infrastructure	infrastructure	infrastructure	
To your knowledge are specific non-structural improvements to reduce seismic risk incorporated to make health facilities more resilient (e.g. tying down or relocating essential equipment)?	Have occurred in most educational facilities	Have occurred in some educational facilities	Have occurred in a few exceptional educational facilities	Have not occurred
To your knowledge are specific non-structural improvements to reduce seismic risk incorporated to make educational facilities more resilient (e.g. tying down or relocating essential equipment)?	Have occurred for most educational services	Have occurred for many educational services	Have occurred for a few exceptional educational services	Have not occurred
Do your Ward offices have a business continuity plan for the aftermath of a damaging earthquake?	Plan exists, implemented, and regularly updated	Plan exists and implemented	Plan exists but not implemented	No plan exists
Does your Ward have a plan for the repair or replacement of	Plan exists, implemented, and regularly updated	Plan exists and implemented	Plan exists but not implemented	No plan exists

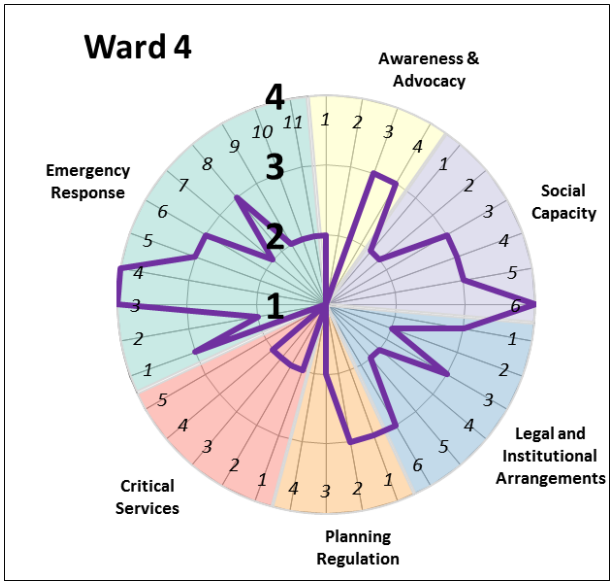
critical lifelines in the aftermath of a damaging earthquake event (e.g. water, electricity, telephone)?				

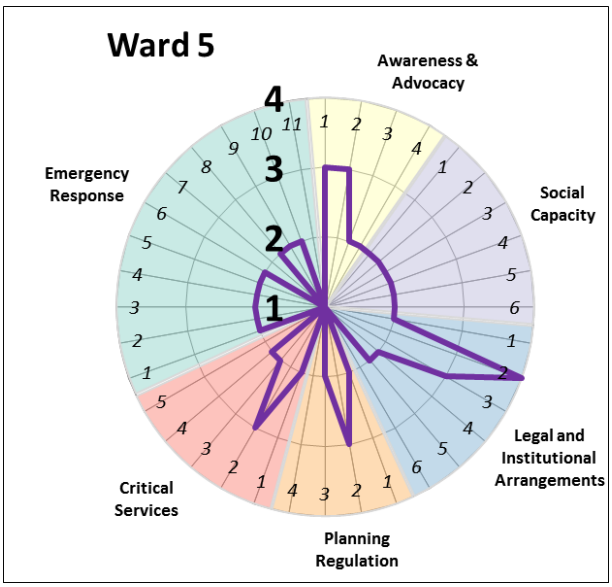
WARD WISE ANSWERS







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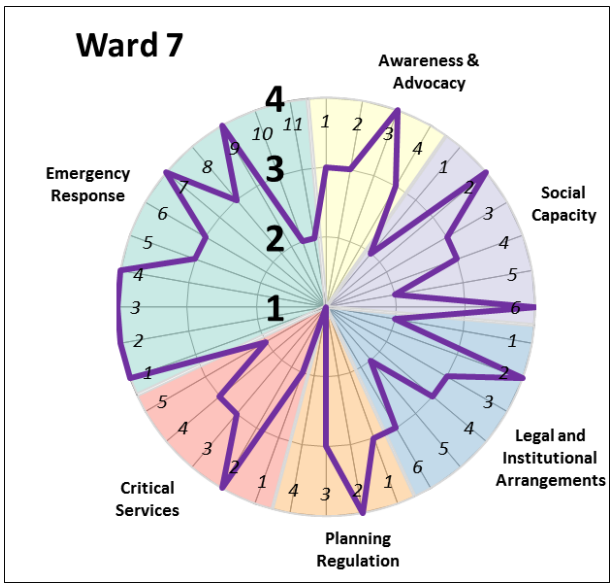
Awareness & Advocacy
Social Capacity
Legal and Institutional Arrangements
Planning Regulation
Critical Services
Emergency Response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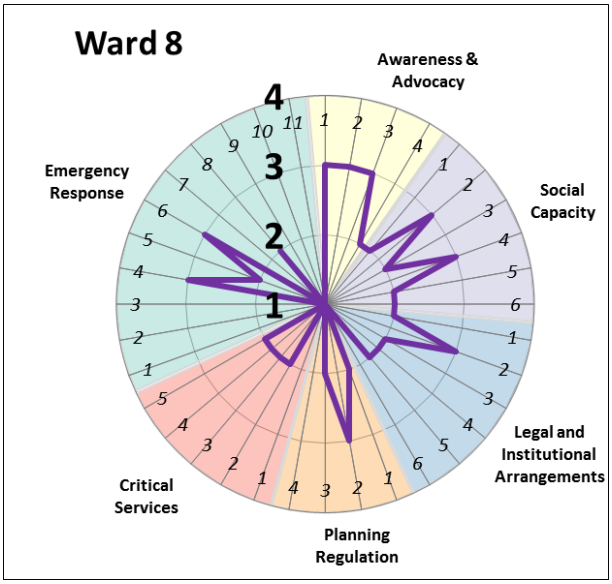
Social Capacity
Legal and Institutional Arrangements
Planning Regulation
Critical Services
Emergency Response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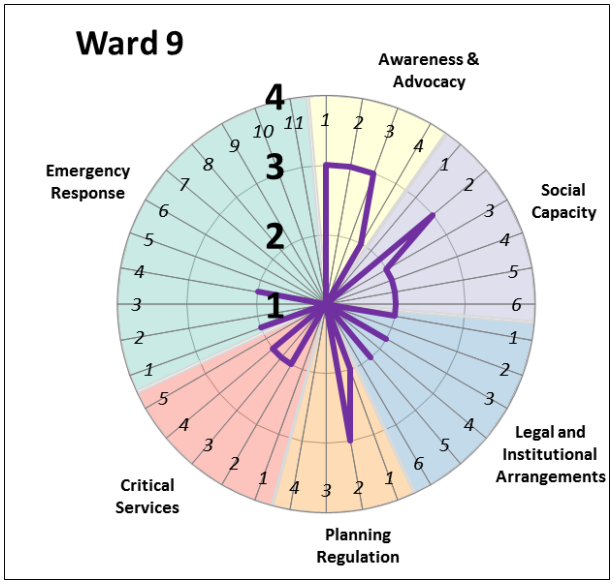
Social Capacity
Legal and Institutional Arrangements
Planning Regulation
Critical Services
Emergency Response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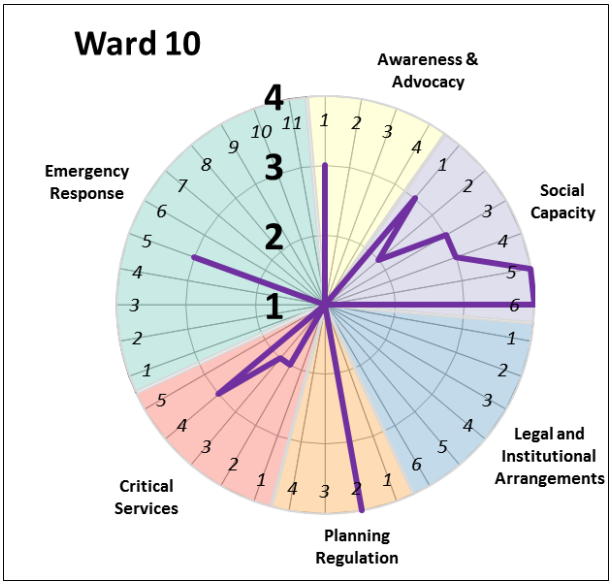
Awareness & Advocacy
Social Capacity
Legal and Institutional Arrangements
Planning Regulation
Critical Services
Emergency Response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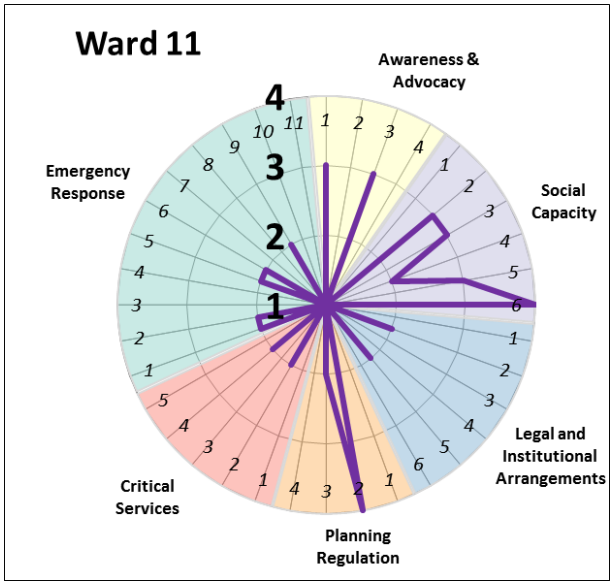
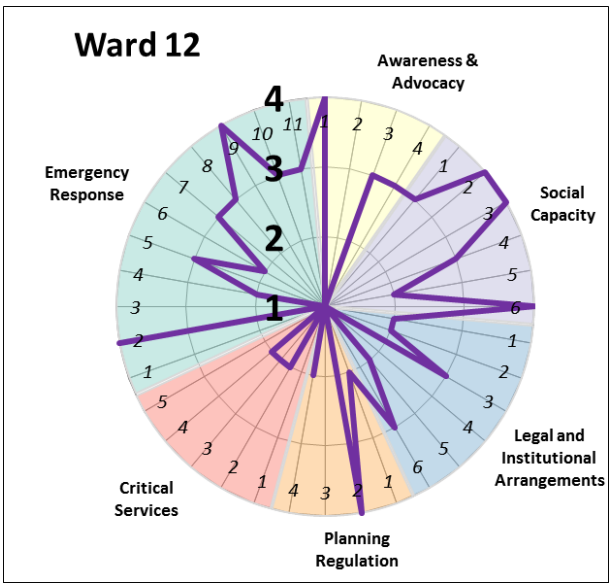
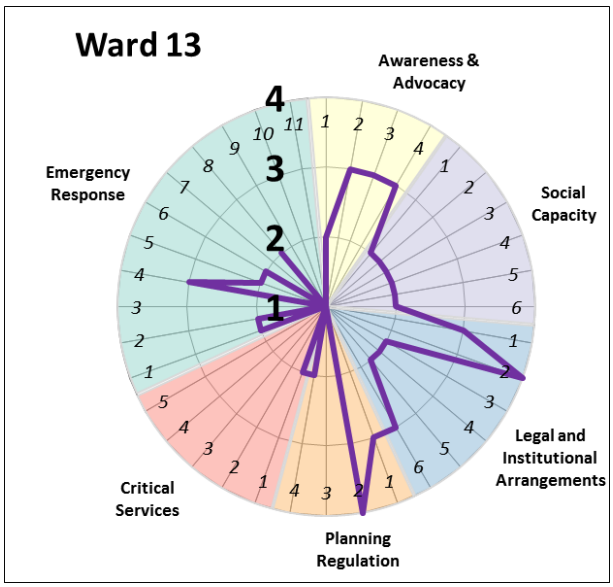
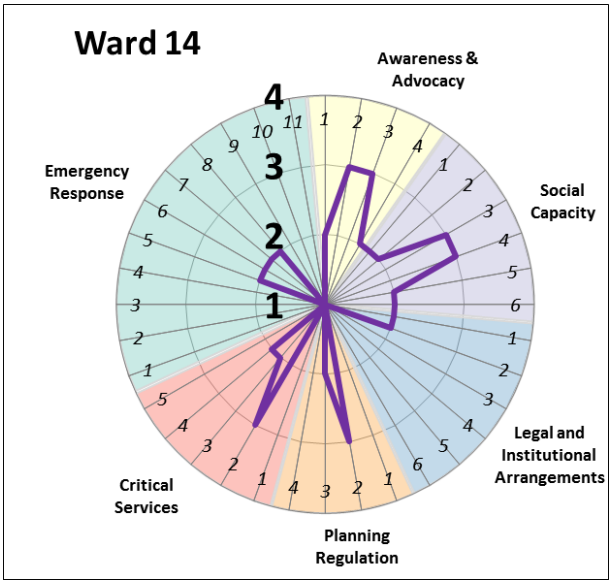
Awareness & Advocacy
Social Capacity
Legal and Institutional Arrangements
Planning Regulation
Critical Services
Emergency Response

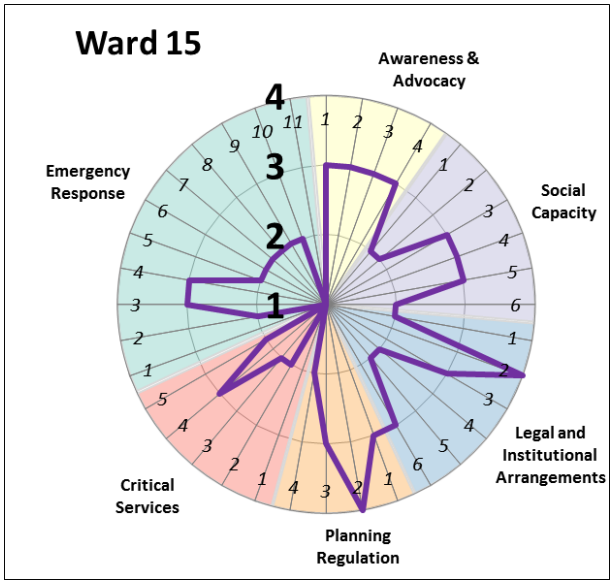

Ward 11
Awareness & Advocacy
Social Capacity
Legal and Institutional Arrangements
Planning Regulation
Critical Services
Emergency Response

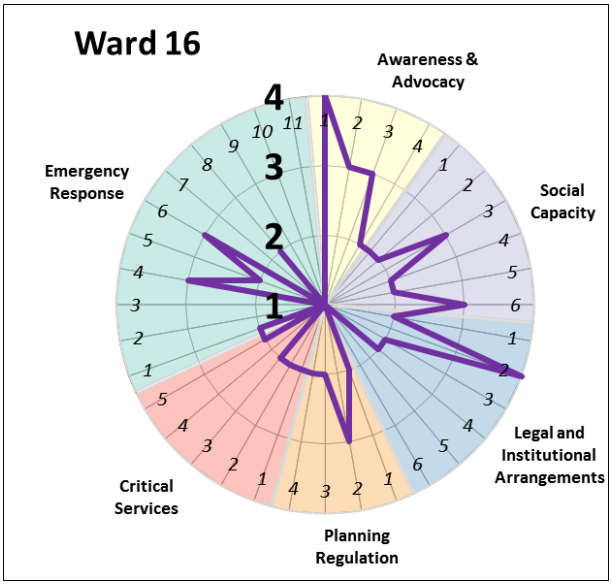
APPENDIX: Ward *Wise Answers*

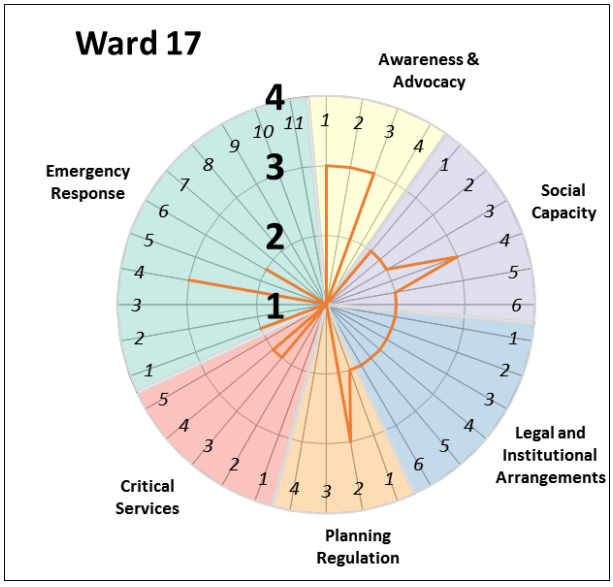


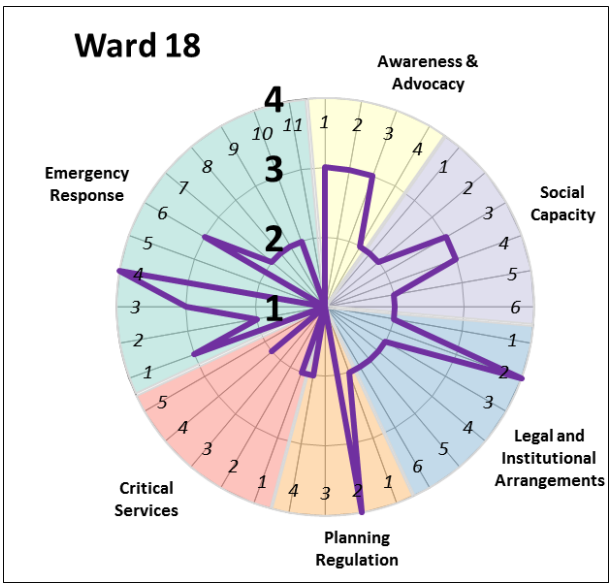








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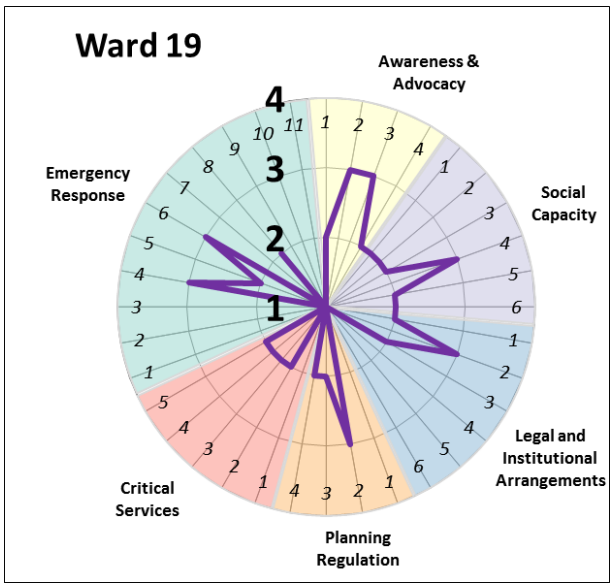
Awareness & Advocacy
Social Capacity
Legal and Institutional Arrangements
Planning Regulation
Critical Services
Emergency Response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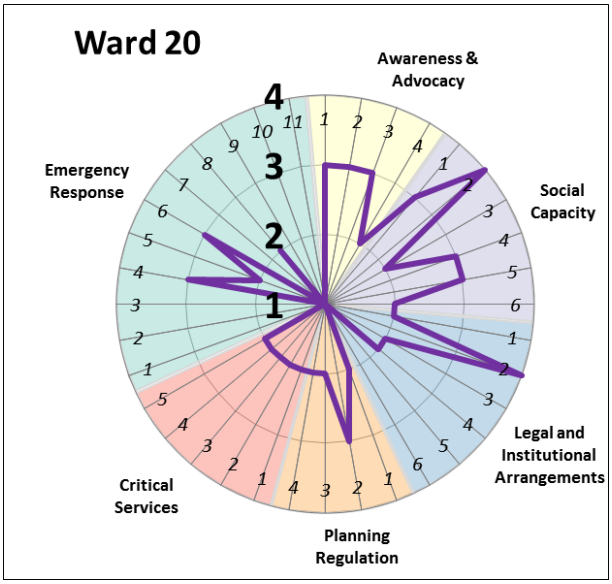
Awareness & Advocacy
Social Capacity
Legal and Institutional Arrangements
Planning Regulation
Critical Services
Emergency Response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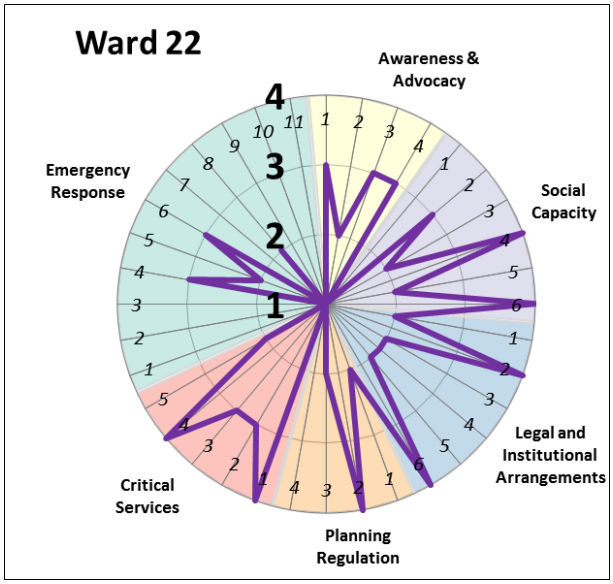
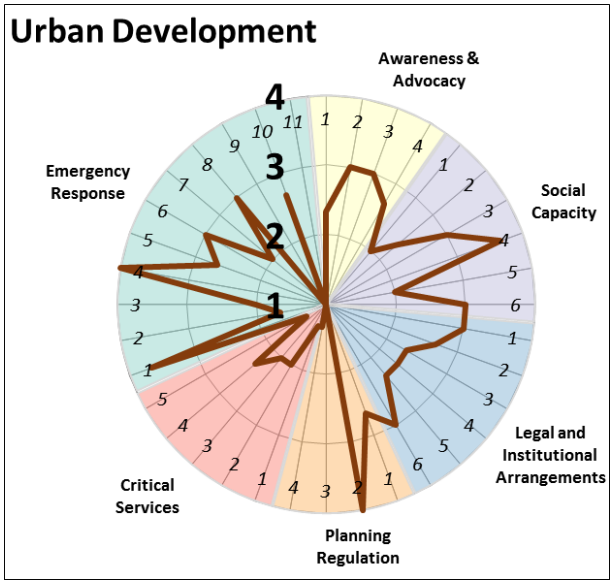
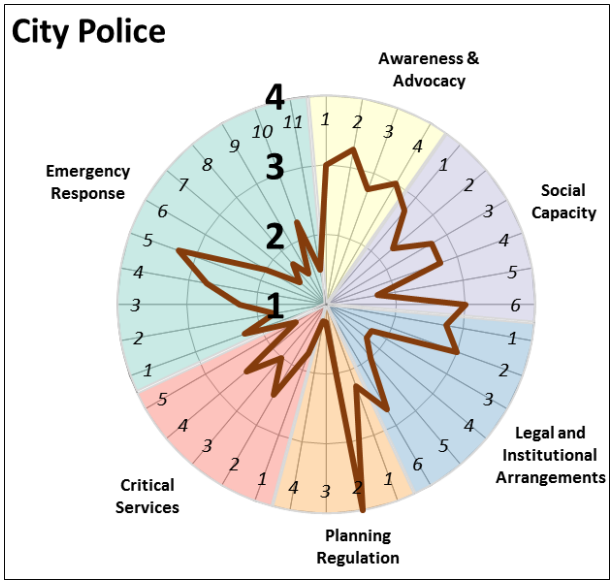
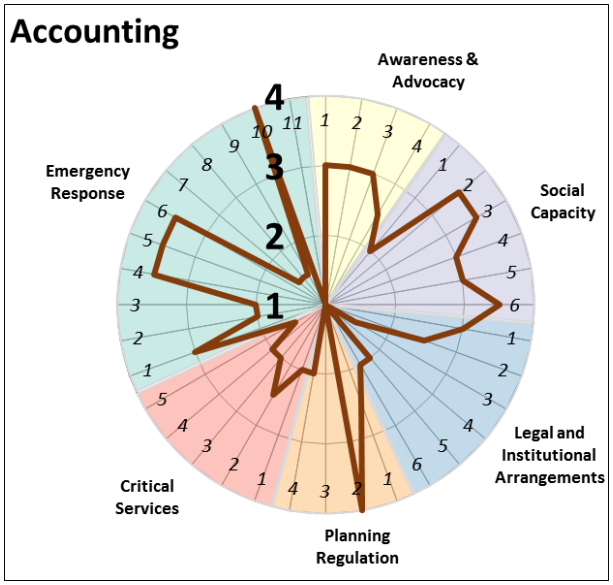
Social Capacity
Legal and Institutional Arrangements
Planning Regulation
Critical Services
Emergency Response

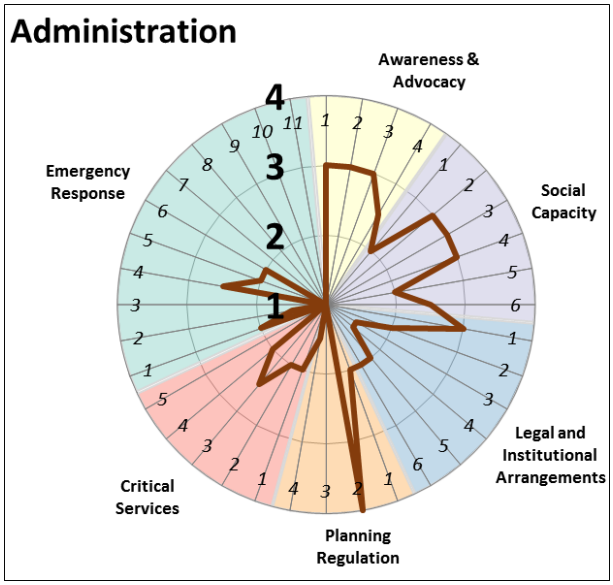

Ward 22
Awareness & Advocacy
Social Capacity
Legal and Institutional Arrangements
Planning Regulation
Critical Services
Emergency Response

MUNICIPALITY WISE ANSWERS

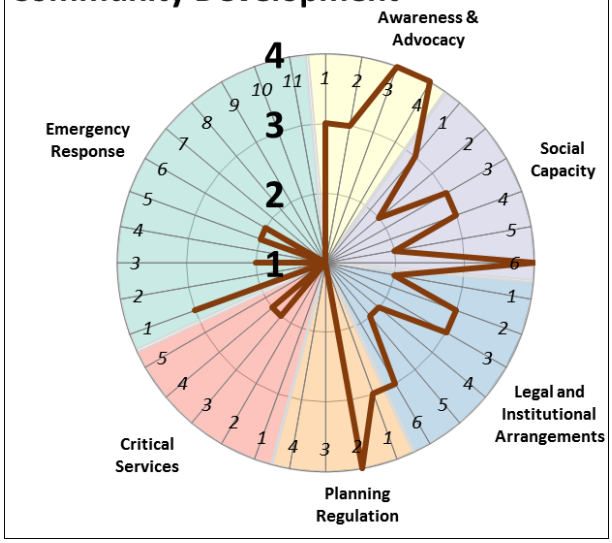




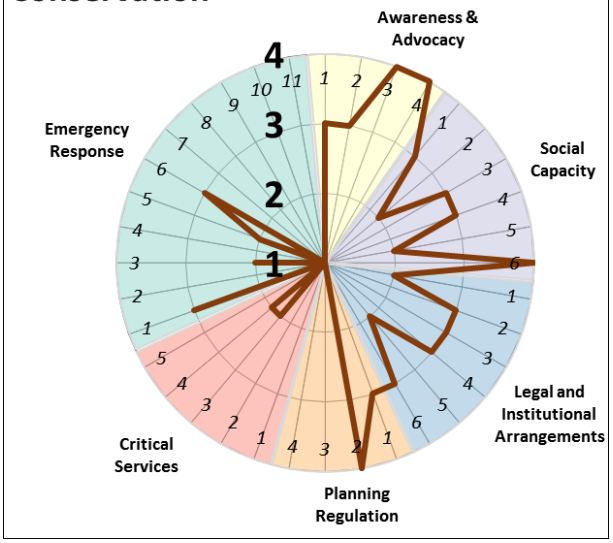




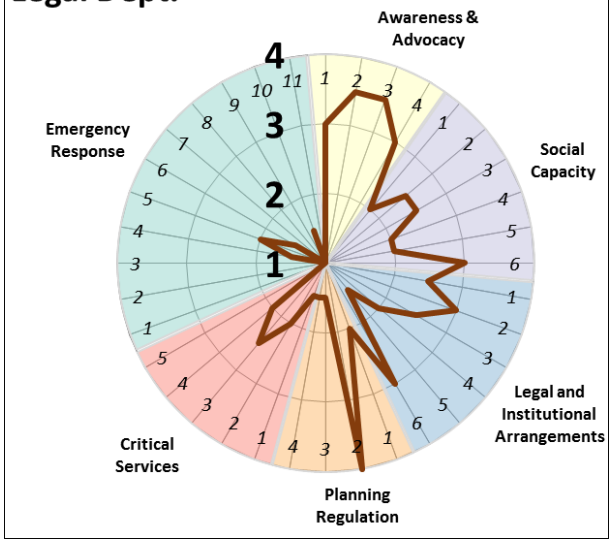
Community Development



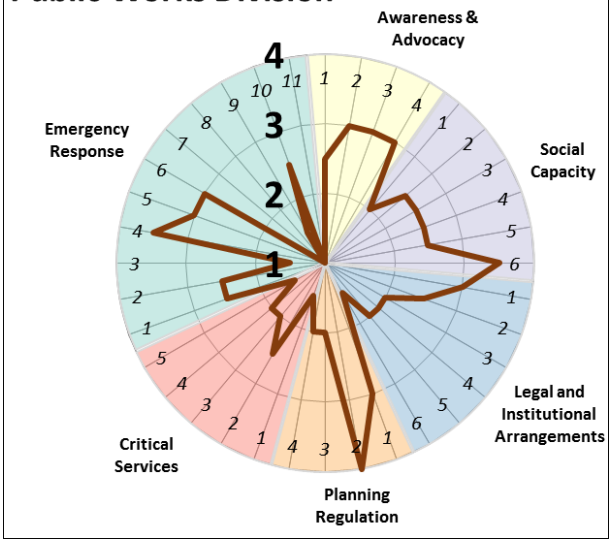
Conservation



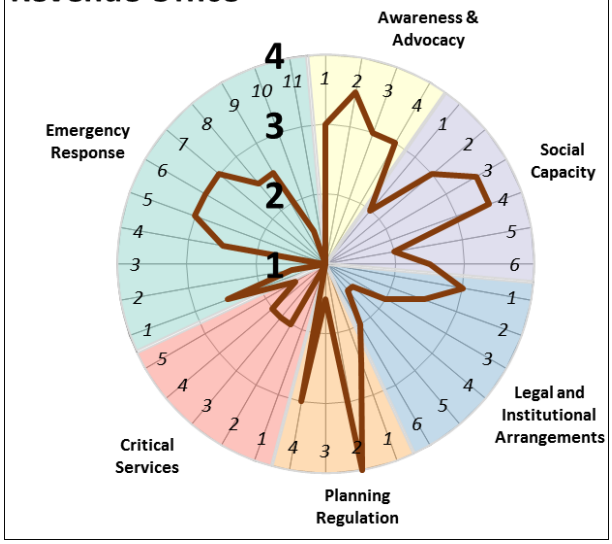
Legal Dept.



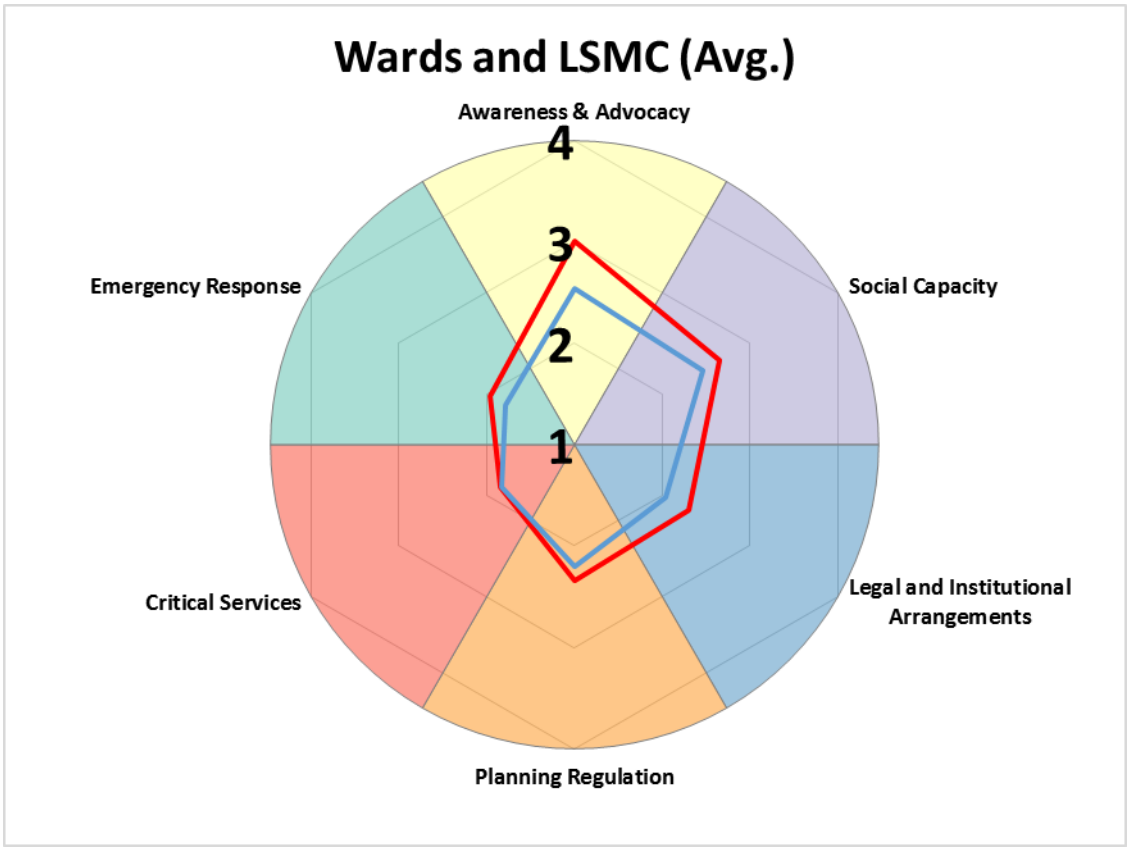
Public Works Division



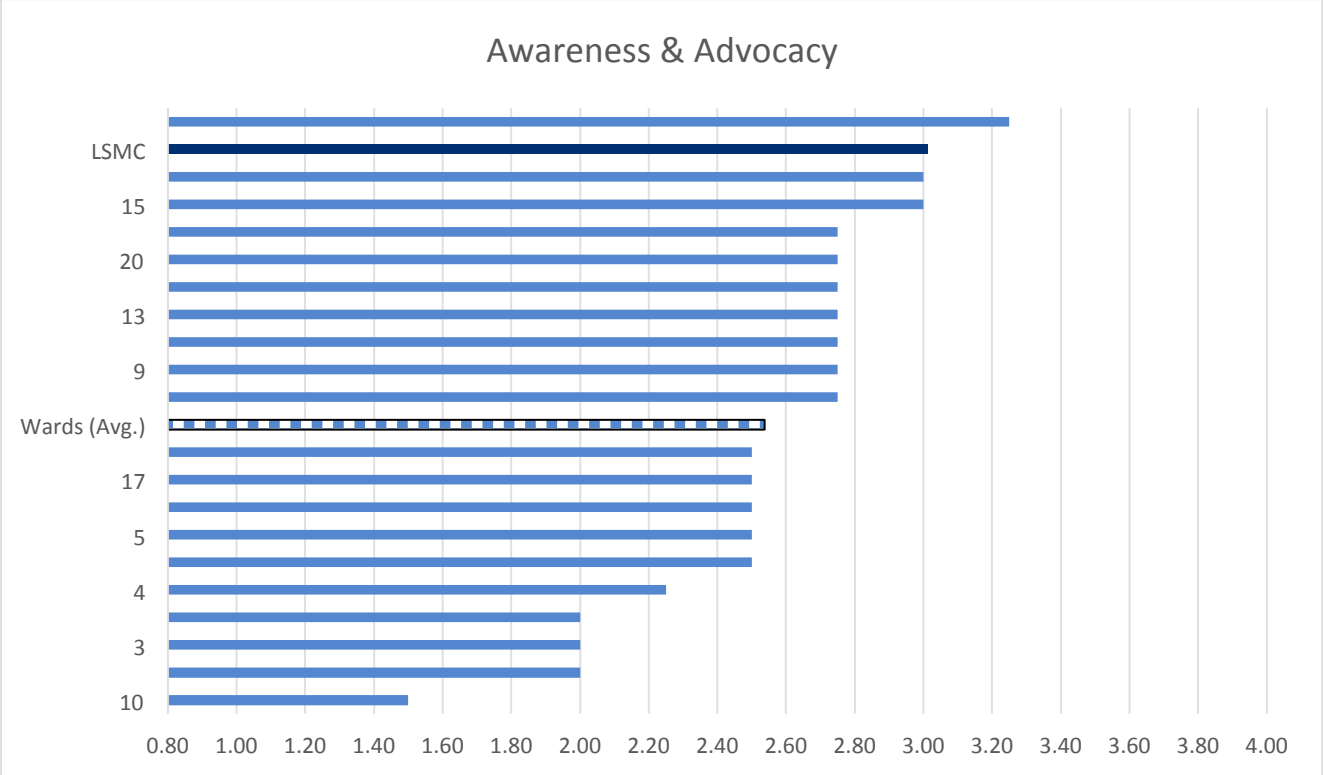
Revenue Office

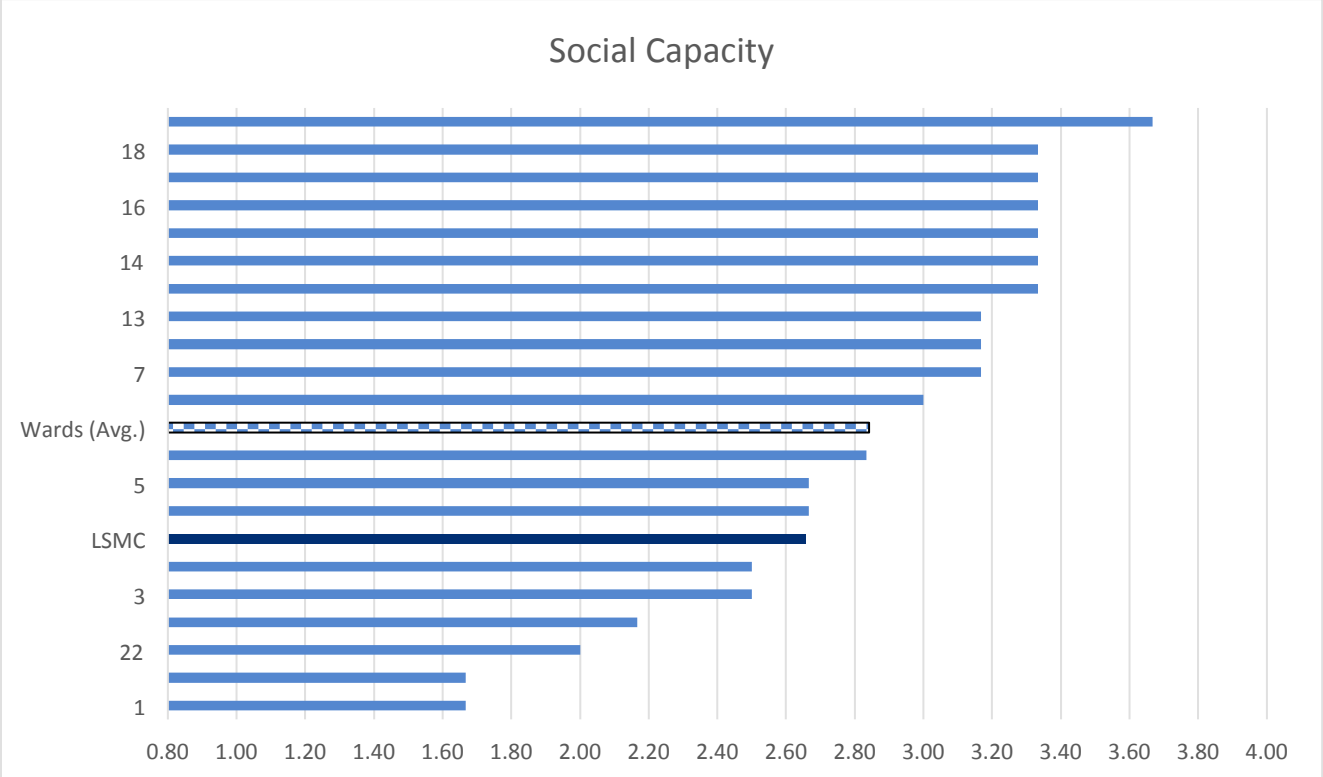


THEME WISE ANSWERS

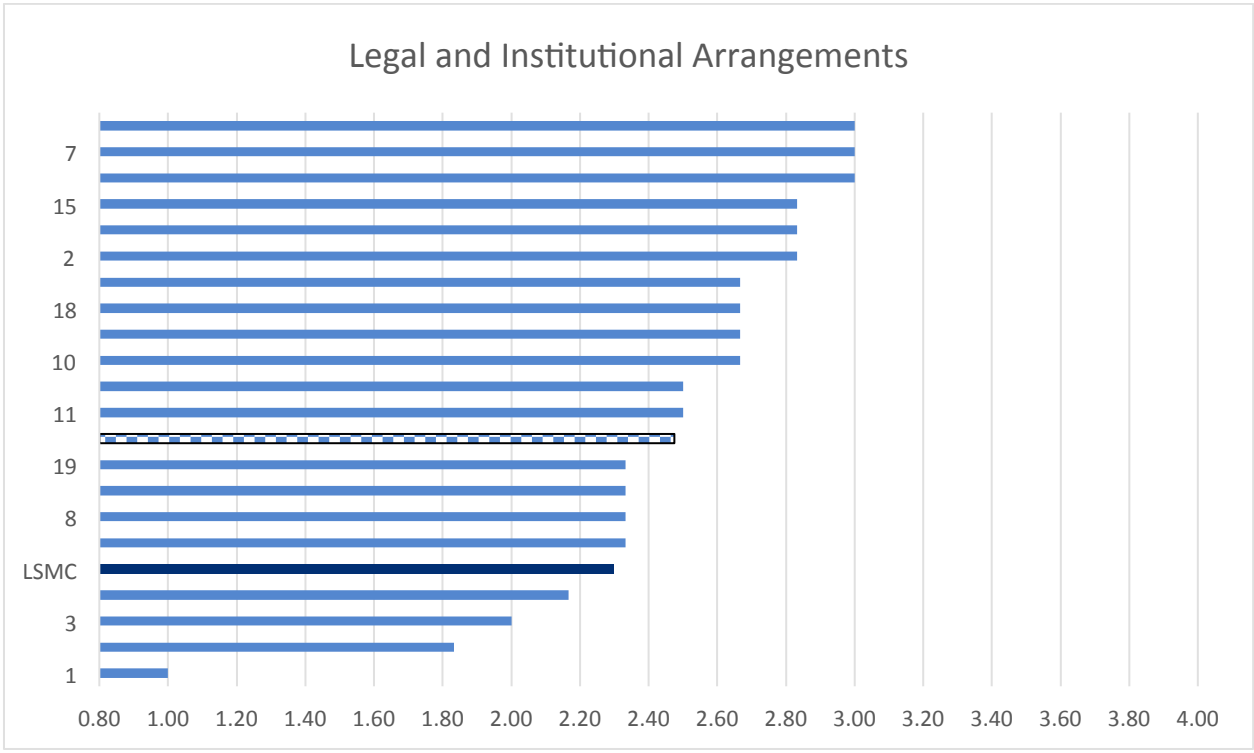


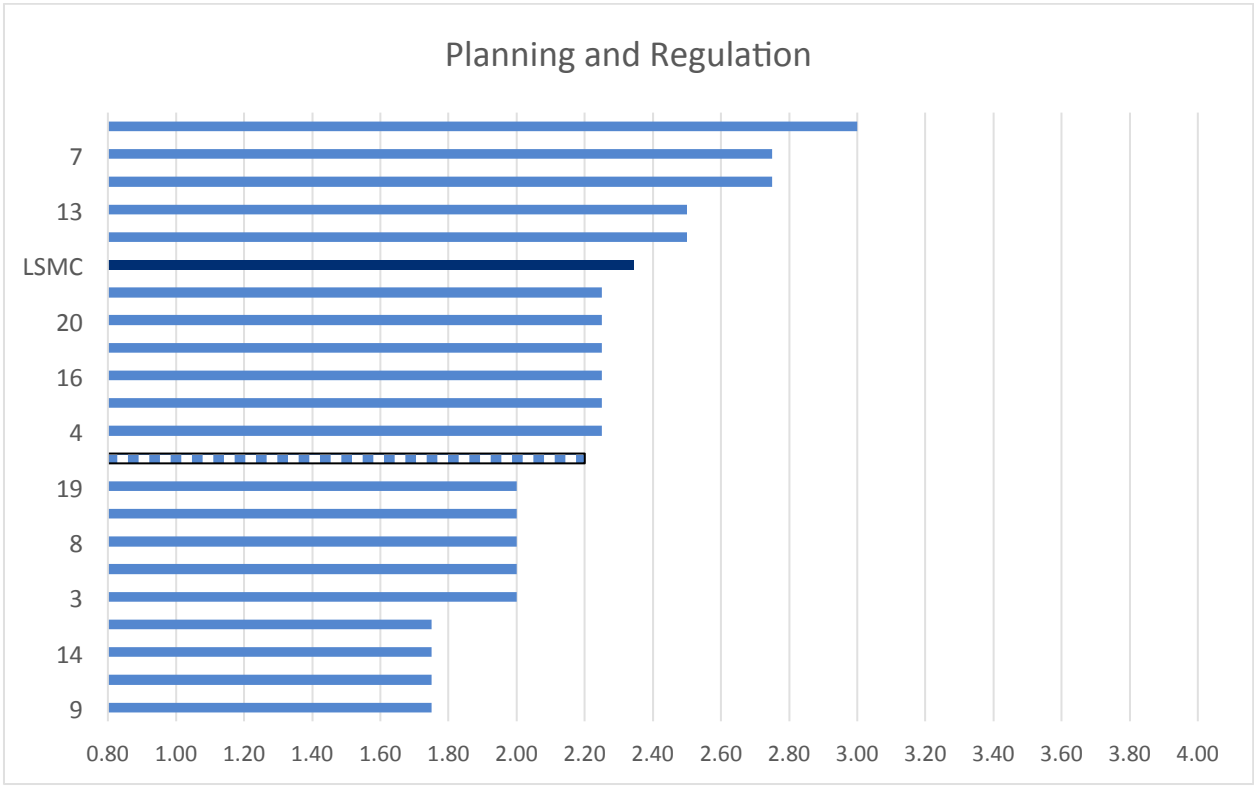
Ranking Results per Theme

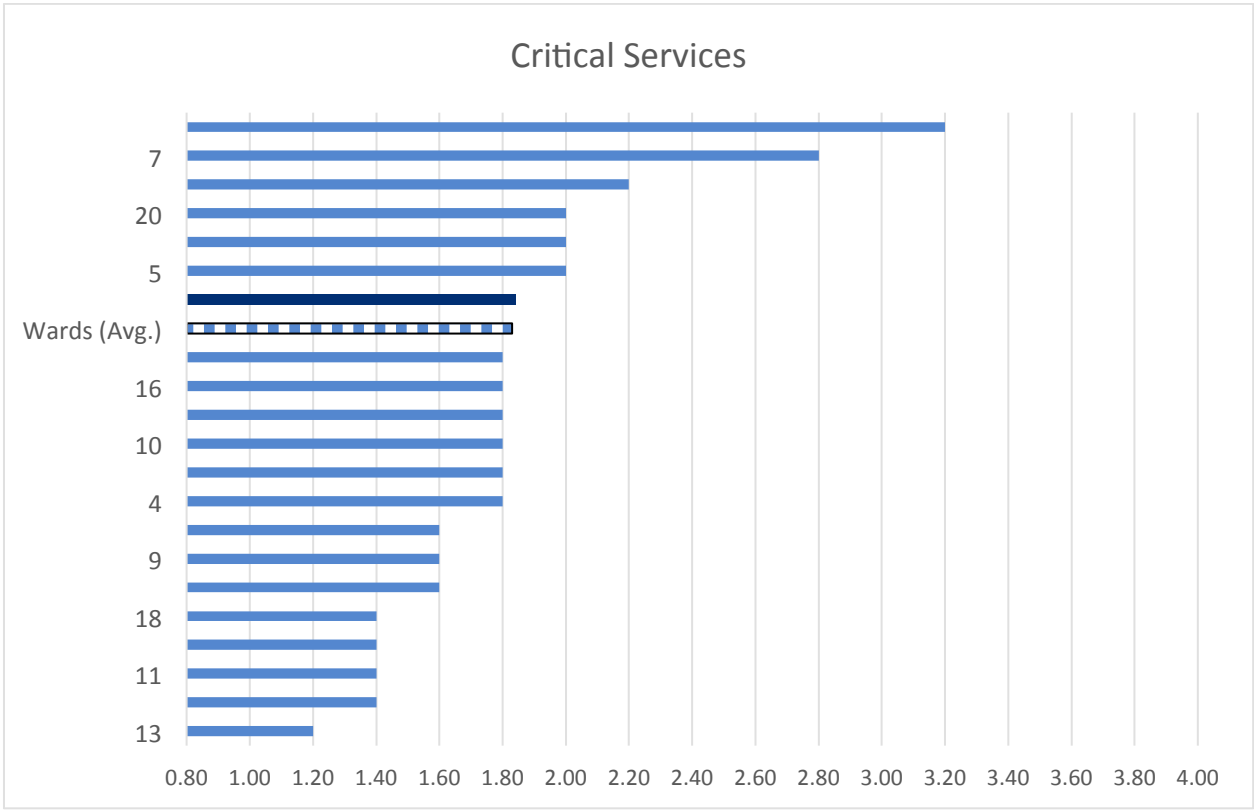


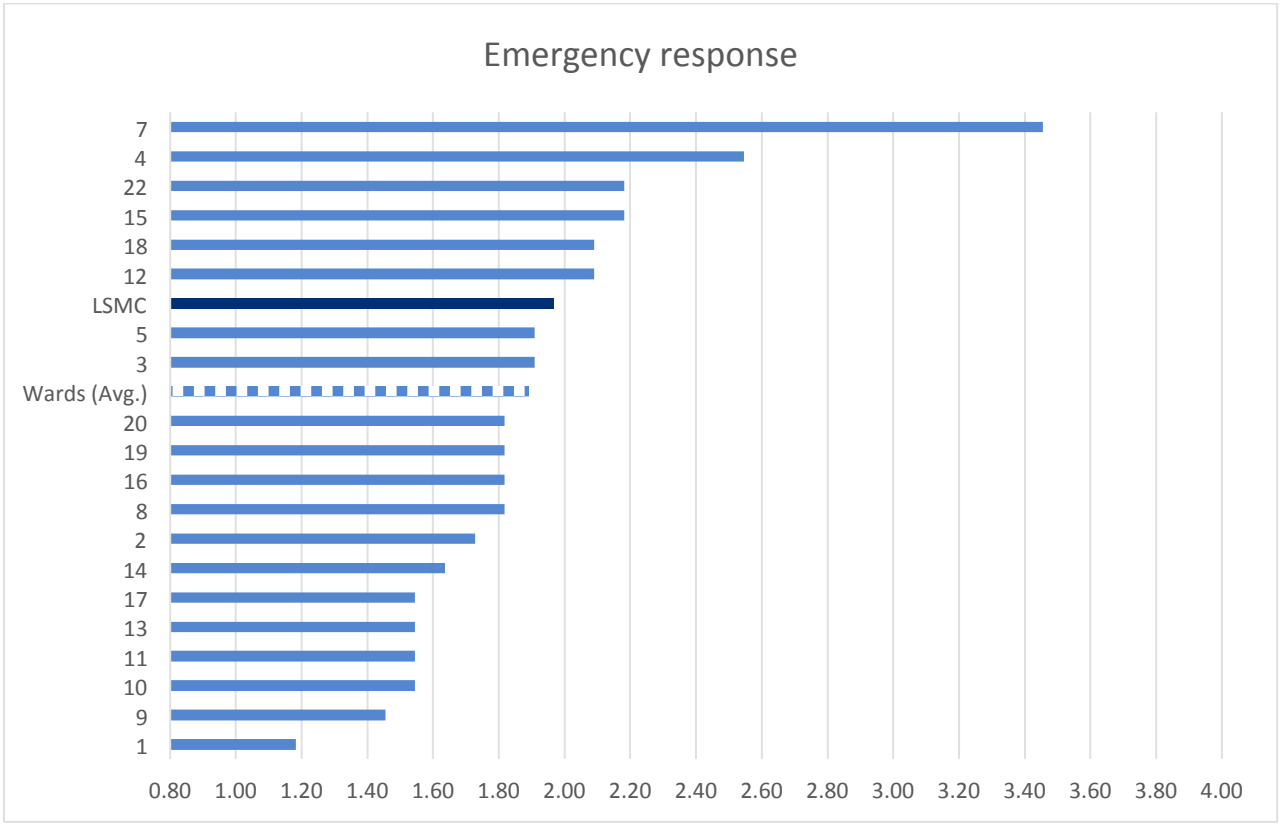


APPENDIX: Ranking Results per Theme






Critical Services
7
20
5
Wards (Avg.)
16
10
4
9
18
11
13
0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00 3.20 3.40 3.60 3.80 4.00


Emergency response
7
4
22
15
18
12
LSMC
5
3
Wards (Avg.)
20
19
16
8
2
14
17
13
11
10
9
1
0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.20 2.40 2.60 2.80 3.00 3.20 3.40 3.60 3.80 4.00